

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
22 July 2004 (22.07.2004)

PCT

(10) International Publication Number
WO 2004/061080 A3

- (51) International Patent Classification⁷: **C12N 15/29**, 15/82, A01H 5/00
- (21) International Application Number:
PCT/US2003/041098
- (22) International Filing Date:
23 December 2003 (23.12.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/436,564 26 December 2002 (26.12.2002) US
- (71) Applicant (*for all designated States except US*): SYN-
GENTA PARTICIPATIONS AG [CH/CH]; Schwarzwal-
dallee 215, CH-4058 Basel (CH).
- (72) Inventor; and
- (75) Inventor/Applicant (*for US only*): **COOPER, Bret**
[US/US]; 3314 Via Alicante, La Jolla, CA 93037 (US).
- (74) Agent: **TAYLOR, Arles, A., Jr.**; Jenkins, Wilson & Tay-
lor, P.A., Suite 1400, University Tower, 3100 Tower Boule-
vard, Durham, NC 27707 (US).
- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR,
CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD,
GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR,
KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN,
MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU,
SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA,
UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (*regional*): ARIPO patent (BW, GH,
GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE,
SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA,
GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:
— *with international search report*
- (88) Date of publication of the international search report:
4 November 2004
- For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.*

(54) Title: STRESS-RELATED POLYPEPTIDES AND USES THEREFOR

(57) Abstract: Disclosed are proteins, and nucleic acids encoding such proteins, involved in or associated with the stress response (both biotic and abiotic stress) in plants. Also disclosed are uses for such proteins.

WO 2004/061080 A3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/41098

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C12N 15/29, 15/82; A01H 5/00

US CL : 536/23.6; 435/320.1, 419, 468; 800/289, 290

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 536/23.6; 435/320.1, 419, 468; 800/289, 290

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Please See Continuation Sheet**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E, X —	US 6,677,502 B1 (ALLEN et al.) 13 January 2004 (13.01.2004), especially columns 149-152 SEQ ID NO:69, abstract, column 2 lines 25-32, column 9 lines 5-12, column 10 lines 19-37; column 11 lines 38 - column 12 line 10, column 13 lines 1-25, column 50 line 45 - column 54 line 67, columns 369-370.	1-4, 16, 19-20, 23, 30-46
E, Y		21-22, 24-26
P, X —	Database GenBank on STIC, National Center for Biotechnology Information (Bethesda, MD USA), Accession No. AY224441, COOPER et al., Gene Sequence, 15 April 2003.	1-4, 16, 30-37
P, Y		19-26, 38-46
P, X —	COOPER et al. A network of rice genes associated with stress response and seed development. Proc. Natl. Acad. Sci. USA. 15 April 2003, Vol. 100, No. 8, pages 4945-4950, especially page 4945 column 2 lines 52-53.	1-4, 16, 30-37
P, Y		19-26, 38-46
X —	Database GenBank on STIC, National Center for Biotechnology Information, (Bethesda, MD, USA), Accession No. BT002730, CHEUK et al., 23 December 2002.	1, 16, 30-37
Y		2, 19-26, 38-46



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier application or patent published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

30 July 2004 (30.07.2004)

Date of mailing of the international search report

18 AUG 2004

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Facsimile No. (703) 305-3230

Authorized officer

Cynthia Collins

Telephone No. 571-272-1600

INTERNATIONAL SEARCH REPORT

C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	MASSEY, V. The Chemical and biological versatility of riboflavin. Biochemical Society Transactions. 2000, Vol. 28, No. 4, pages 283-296, especially page 285 column 2 third paragraph - page 286 column 1 first paragraph.	1-2, 16, 19-26, 30-46

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/41098

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claim Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claim Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claim Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation Sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1-4, 16, 19-26, 30-46, directed to SEQ ID NO:1

Remark on Protest

☐
☐

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Groups I-LVI, claim(s) 1-16, 19-26 and 30-46, drawn to an isolated nucleic acid, a transgenic plant or plant cell, an expression cassette, and methods of using said nucleic acid and expression cassette to transform plant cells. Group I is directed to an isolated nucleic acid molecule of SEQ ID NO:1, Group II is directed to an isolated nucleic acid molecule of SEQ ID NO:3, ... Group LVI is directed to an isolated nucleic acid molecule of SEQ ID NO:111.

Groups LVII-CXIII, claim(s) 17-18 and 27-29, drawn to an isolated polypeptide and a method of producing said polypeptide. Group LVII is directed to an isolated polypeptide of SEQ ID NO:2, Group LVIII is directed to an isolated polypeptide of SEQ ID NO:4, ... CXIII is directed to an isolated polypeptide of SEQ ID NO:112.

Groups CXIV-CXLV, claim(s) 45, drawn to a method of using an expression cassette comprising an isolated nucleic acid molecule to transform plant cells. Group CXIV is directed to the use of an isolated nucleic acid molecule of SEQ ID NO:113, Group CXV is directed to the use of an isolated nucleic acid molecule of SEQ ID NO:115, ... Group CXLV is directed to the use of an isolated nucleic acid molecule of SEQ ID NO:173.

The inventions listed as Groups I-LVI do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the technical feature linking Groups I-CXLV is an isolated nucleic acid encoding a stress-related polypeptide obtained from rice. However, an isolated nucleic acid encoding a stress-related polypeptide obtained from rice is anticipated by WEN et al. (Plant Physiol. 2002 Aug;129(4):1880-91), and therefore does not constitute a special technical feature as defined by PCT Rule 13.2, because it does not define a contribution over the prior art. Furthermore, the special technical feature of each of Groups I-LVI and CXIV-CXLV is the distinct nucleic acid sequence that characterizes each group. The special technical feature of each of Groups LVII-CXIII is the distinct amino acid sequence that characterizes each group.

Continuation of B. FIELDS SEARCHED Item 3:

STN (agricola, biotechno, caba, caplus, medline, uspatfull): inventor name, plant, stress, riboflavin, GTP cyclohydrolase II, 3,4-dihydroxy-2-butanone-4-phosphate synthase; STIC sequence search for SEQ ID NO:1.